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ALIX YALE & RISTAS LLP
750 MAIN STREET
SUITE 1400
HARTFORD, CT 06103

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RECORD OF ORAL HEARING
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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MARTIN HERKEL, THOMAS PSCHORN,
and ERIC XU

Appeal 2009-010436 and 2009-010847
Application 10/483648 and 10/677545
Technology Center 1700

Oral Hearing Held: January 13, 2010

Before JEFFREY T. SMITH, LINDA M. GAUDETTE, and
KAREN M. HASTINGS, *Administrative Patent Judges.*

ON BEHALF OF THE APPELLANT:

L. JAMES RISTAS, ESQUIRE
Alix, Yale & Ristas, LLP
750 Main Street
Hartford, CT 06103-2721
(860) 527-9211

Appeal 2009-010436 & 010847
Application 10/483648 and 10/677545

1 *The above-entitled matter came on for hearing on Wednesday,*
2 *January 13, 2010, commencing at 9:55 a.m., at the U.S. Patent and*
3 *Trademark Office, 600 Dulany Street, Alexandria, Virginia, before*
4 *Ashorethea Cleveland, Notary Public.*

5

6 JUDGE SMITH: Okay, Mr. Ristas. Before you begin, could
7 you please introduce your guest?

8 MR. RISTAS: Yes. My guest is Rose Mary Wargo, W-a-r-g-o,
9 who is the intellectual property professional or coordinator for the assignee
10 of both applications.

11 JUDGE SMITH: Thank you, and after you have settled in, you
12 can begin.

13 MR. RISTAS: Yes. What I propose is to summarize the state
14 of art and the relevant chemistry because that is important in being able to
15 assess the claims in view of the cited references, and then summarize the
16 inventive theory, and then address the two applications individually.

17 As a basis for addressing the prior art, I'd like to distribute
18 these, if I may, which are figures one and two of one of the references of
19 record, the Cannell article. So, it's not a new item for the record.

20 Now, a problem to be solved in the present context is to
21 improve the process for manufacturing bleached mechanical pulp and the
22 objectives are not only to improve the bleaching but to try to minimize the
23 energy usage while maintaining the properties of the pulp; and again, the
24 properties are of two types, brightness and quality, and quality has attributes

1 of freeness, tensile strength and the like.

2 So, brightness is not the only quality that is important in the
3 pulp. Now, looking at the Cannell figures, these are two representations of
4 what was considered conventional state of the art as of the year 2000 which
5 was immediately before these applications were filed, and I think this is the
6 context that's important to keep in mind.

7 They are very similar but for one small difference which isn't
8 really relevant but if you'll look at, for example, figure two, again we're
9 looking at bleached mechanical pulp.

10 The important steps are: As the chips come in, they're cleaned
11 and separated and once they reach the fourth block on the top there's an
12 indication of multistage impregnation, and following that is primary refining
13 and this is in the mechanical device where the wood is in a sense ground
14 between rotating plates and that generates heat as well as refining the pulp,
15 the wood.

16 After the primary refining, there is an interstage. It can be
17 washing. It can be bleaching. It goes then to a secondary refiner and further
18 cleaning and separating.

19 That is the basis of the mechanical refining; but because of the
20 heat, mechanical refining tends to discolor the wood. So, over time, people
21 have tried to bleach the wood and initially it was at the end of the process,
22 after the secondary refining -- and there's one shown there -- and they kept
23 moving it up a bit into interstage, even trying in the primary refining and
24 then, as you see, going all the way back to the impregnation stage.

1 If you look carefully at that fourth block on the top line,
2 "Impregnation," it says, "Sodium sulfite or hydrogen peroxide" and caustic."

3 Now, typically, the refiners are either pressurized or
4 unpressurized. The unpressurized are atmospheric. They tended to use the
5 hydrogen peroxide and caustic; and for the pressurized, they tended to use
6 the sodium sulfite because caustic, the sodium hydroxide, would especially
7 be harmful at higher temperatures that were in the pressurized refiners. It's
8 not exclusively different but the mindset is in that direction.

9 So, these chemistries are important to differentiate because the
10 Examiner tends to use them interchangeably and I wanted to distinguish
11 them.

12 With the hydrogen peroxide or caustic, the purpose is that the
13 hydroxide ion breaks down the bonds in the wood fibers. So, it actually
14 performs a structural softening, if you will.

15 But again, one needs to be careful that this does not have too
16 high an alkalinity which can damage the wood or excessively high
17 temperatures.

18 Again, going back to the bleaching, it was found that there can
19 be advantage to adding the bleach at that stage. You have the hydrogen
20 peroxide as the "B" component and the sodium hydroxide as the "A"
21 component. But care must be taken because of the heat and the peroxide can
22 break down, as well; in which case, you will get discoloration.

23 For a different purpose, the sulfite, the sodium sulfite is really
24 for -- call it conditioning the chips. They impregnate the surface of the chips

1 to help in the qualities that we talked about, freeness and tensile strength and
2 the like; but they don't really break down the bonds to help in refining.

3 So, when you break down the bonds with sodium hydroxide,
4 you need less energy for refining, and you don't get that effect with the
5 sulfite.

6 Again, looking back at Cannell, even when they impregnate
7 with an alkaline and a peroxide, the conventional thinking was that there
8 would be enough alkaline put in initially to supply the mild alkaline that's
9 needed for the peroxide to work properly throughout the rest of the process,
10 the downstream bleaching.

11 So, the basic premise was load up with the alkaline in
12 impregnation or the first stage, whatever that first stage is where you put it
13 in. You load it up and then you maintain a continuing residual that enables
14 you to periodically put in peroxide downstream.

15 Now, that is the basis of the other prior art of record except
16 Cannell which is an anomaly that was cited in the second application.

17 In the brief and upon further review with my technical expert, I
18 think Cannell needs a bit of clarification relative to how I characterized it in
19 the brief. But presently, to the best of our understanding -- and it's a bit
20 confusing in Chanell -- Channell does the reverse where you load up the
21 peroxide at the first point of AP which is in the refiner, and then downstream
22 they selectively add alkaline. It's a buffer alkaline. It's a different kind of
23 alkaline but in both instances, Channell, the other references of record and
24 Haynes -- I'm sorry. Haynes is the anomaly in which they load up the

Appeal 2009-010436 & 010847
Application 10/483648 and 10/677545

1 peroxide and then the alkaline in spurts downstream. But in both instances,
2 the conventional prior art and this Haynes anomaly, the premise seems to be:
3 Load up initially and then one of the components decreases downstream and
4 adjustment is made in the other component of the AP.

5 In both instances, the inventions on appeal have a different
6 underlying theory and that is: You introduce the alkaline and the peroxide
7 together at a series of locations in the process. Now the first one is always
8 impregnation and it's an impregnation that is -- as the claims say, there's a
9 pressing. There's a compression, then an expansion. The impregnation
10 occurs in connection with the pressing and the simultaneous. The alkaline
11 and the peroxide are there simultaneously, and the claim says, alkaline,
12 peroxide solution is introduced. So, it's in the same liquid that's introduced.

13 Then in the first case on the appeal, the 648 application, there's
14 a second introduction in the refiner of an AP solution. They're together.

15 In the 545 application, the other one, you have the introduction
16 simultaneously of this AP solution in the impregnation step. Now the AP
17 solution -- that is the A and the P together -- are in the blow line which is
18 immediately downstream of the primary refiner.

19 And the other difference in the second application, the 545, is
20 that the alkaline is specifically limited to sodium hydroxide.

21 So, in the 648 application, it's alkaline- peroxide solution in
22 these two steps; and in the 545, it's sodium hydroxide, AP, in two distinct
23 steps.

24 So, this is the criticality here, that we're not relying on a

Appeal 2009-010436 & 010847
Application 10/483648 and 10/677545

1 residual of one component and then adding another along the way but rather
2 introducing the ideal amounts of both components at the same time in
3 distinct sequence. And in this way, less total chemistry can be used and you
4 get the ideal effectiveness of this combination of A and P because you can
5 put in the amounts that are best suited for the conditions that are present in
6 each step.

7 Now, I would like to focus in a bit more now on the first
8 application, the 648. The claims are in the appeal brief and the specific
9 arguments are there, and I'm sure that you will consider those carefully. So,
10 I'm not going to talk about the claims. There are quite a few of them in
11 there.

12 I just want to say that claim 1 is the representative claim and
13 claim 27 is kind of the back-up representative claim. But the key feature in
14 claim 1 as I just mentioned is: It's an AP solution that is introduced,
15 impregnation and in the refiner, and not only is the AP together but it's
16 introduced in places where it mixes instantly with the material, in the
17 impregnator and in the refiner, and that enables you to introduce the ideal
18 quantities.

19 Now, this application or this claim 1 -- again, I just want to
20 focus on claim 1 -- was rejected on the basis of the Prusas reference as the
21 primary reference modified by Hook.

22 Both of these are in the general context of the Channell figures
23 that I presented earlier in that there is an impregnation and only peroxide is
24 introduced downstream to complete the bleaching.

1 Now, in Prusas, the refiner is a pressurized refiner and the first
2 impregnation step is sodium hydroxide with the peroxide; but Prusas
3 deliberately removes the sodium hydroxide and the peroxide.

4 Basically, after that first impregnation, he doesn't want sodium
5 hydroxide in the system anymore and he then goes to a different
6 impregnation of the sulfite.

7 As I mentioned earlier, sodium hydroxide impregnation and
8 sulfite impregnation are for two different purposes. So, he doesn't want the
9 sodium hydroxide to carry forward.

10 Now, the sulfite does have alkalinity. So, it will provide the
11 extent of alkalinity needed for downstream peroxide. But he doesn't
12 mention how the peroxide goes in. He just says, it's conventional.

13 Now, Hook. The Examiner has used Hook for the purpose of
14 showing a knowledge of an upstream impregnation and then alkaline and
15 peroxide in refiner.

16 I vigorously oppose the Examiner's assertion that Hook shows
17 or teaches the introduction of both alkaline and peroxide in the refiner.
18 Hook shows many examples but in none of them is the step following
19 impregnation, introducing both alkaline and peroxide.

20 So, Hook's impregnations, the one that are useful, are at
21 atmospheric pressure whereas Prusas is a high-pressure refiner but --

22 JUDGE SMITH: Excuse me. It appears that the Examiner's
23 position is that Prusas teaches the initial step but excludes teaching refining
24 in the tower to which he turns to the Hook reference for that disclosure.

1 MR. RISTAS: We're not asserting that bleaching in the tower
2 is essential for patentability because the process to be completed -- all the
3 bleaching cannot be achieved only upstream. So, eventually the material
4 goes to a bleaching tower to complete the bleaching.

5 So, we're not asserting that having the bleaching tower in the
6 system is a patentable distinction.

7 JUDGE SMITH: Okay. With that interpretation then, what
8 portion of your claim does Prusas not teach then?

9 MR. RISTAS: Prusas does not teach the introduction of
10 alkaline and peroxide in the refiner, in the refiner.

11 This claim, 648, and the first application we're talking about,
12 the second introduction of the AP solution is in the refiner.

13 So, Prusas just says that the material after impregnation will be
14 bleached in a conventional manner; and again, looking at Channell, that
15 could be in an interstage bleaching. It could be after secondary refining. It
16 could be in a different line altogether, even a different building that is not
17 part of the pulping line.

18 And so, the Examiner in fact admits in his answer that between
19 Prusas and Hook, they do not expressly disclose a nexus between them but
20 in any event neither of them discloses introduction of an AP solution in the
21 refiner.

22 Thus, again, that's what's critical. The A and the P are together
23 when they're introduced in the refiner.

24 We don't dispute that in the system, downstream, as you go

1 along, there is A and P in the system because that's necessary for bleaching
2 but we're arguing that no one has previously taught or suggested or in the
3 combination where the A and the P are combined and introduced in a
4 sequence.

5 Hook does show, which Prusas does not -- Hook shows
6 peroxide in the refiner; but again, that's part of the overview I gave earlier
7 where the prior art shows peroxide in stages alone downstream of the initial
8 AP but Hook does not show the A and the P together in the refiner.

9 So, on that first application, 648, we believe that the prior art
10 cited by the Examiner does not -- first of all, there's no expressed nexus but
11 beyond that neither reference shows AP in the refiner. So, the combination
12 cannot show the claim combination of AP impregnation plus AP in the
13 refiner.

14 Now, moving on, if there are no other questions on that, on that
15 application.

16 JUDGE SMITH: No.

17 MR. RISTAS: Okay. Moving on now to the other application,
18 the 545 application: Again, there are many claims and you can review them
19 in the brief.

20 Claim one is the main claim that we are concerned and which
21 we believe is patent able without the additional limitations that appear in
22 some of the other claims.

23 Claim 1, 18 and 36 are the important claims for us, and there's a
24 claim series, 51 and 50, that depend from claim one which provide

Appeal 2009-010436 & 010847
Application 10/483648 and 10/677545

1 additional details and which if you have the time I would like for you to
2 consider beyond just claim one, just the independent claims.

3 All of these claims, at least all of the independent claims of 1,
4 18 and 36 and particularly one were rejected on the basis of the combined
5 disclosures of Haynes, Channell and Prusas.

6 As I mentioned earlier, the focus I have on Haynes now may
7 differ slightly from what was in the brief but the underlying defects in
8 Haynes are still evident.

9 As I said, Haynes represents a deviation from Channell and the
10 other references in that Haynes does not impregnate at all. If you look at
11 Haynes, other than steaming and cleaning which is conventional, there's no
12 chemical impregnation in Haynes. The first introduction of alkaline or
13 peroxide is in the primary refiner.

14 The other very unusual aspect of Haynes is that they
15 intentionally bleach at a much higher temperature that the others have tried
16 to avoid because of sodium hydroxide having the darkening characteristics,
17 especially at high temperature, and even the breakdown of peroxide at higher
18 temperature.

19 The conventional thinking is, you don't want to bleach at high
20 temperatures but Haynes specifically wants to bleach at high temperature.

21 So, the Examiner has used Haynes as the basic reference, and
22 the Examiner suggests or indicates that Haynes shows disclosure of multiple
23 points for introducing the bleaching liquor, and I'll address that but Haynes
24 does not show impregnation and the Examiner now relies on Channell and

1 Prusas to combine with Haynes to include the step of impregnation.

2 But Haynes and Channell and Haynes and Prusas are not
3 compatible, as I said, because Haynes wants to bleach at high temperature.

4 Now, the claims on appeal are specifically limited to sodium
5 hydroxide as the AP. So, that's the difference that we have, and Haynes
6 specifically wants to avoid the sodium hydroxide.

7 Now, admittedly, he suggests that his bleaching liquor could
8 contain some sort of hydroxide but that is not the teaching to one of ordinary
9 skill, that --

10 JUDGE SMITH: Excuse me. The reference says that you can
11 have up to a hundred percent as a substitute for sodium hydroxide.

12 MR. RISTAS: Right.

13 JUDGE SMITH: I think it's clear that the "up to" language
14 does not mean a hundred percent conversion. So, sodium hydroxide can be
15 present. So, you can move on from that point.

16 MR. RISTAS: Yes. Yes.

17 Turning back to Haynes, the key aspect of Haynes is that they
18 are bleaching at high temperature and the reason they can bleach at high
19 temperature and the teaching they have to bleach at high temperature is that
20 they use an alkaline buffer instead of --

21 JUDGE SMITH: Excuse me there, counselor. It appears the
22 Examiner is taking the Prusas reference as the pretreatment step.

23 MR. RISTAS: Yes.

24 JUDGE SMITH: Why is that product resulting from Prusas

1 incompatible with Haynes?

2 MR. RISTAS: Because Haynes is a -- call it a
3 deviation from conventional thinking with the notion of high-temperature
4 bleaching and there's no reason one of ordinary skill would look to add an
5 impregnation step upstream of Haynes by incorporating an impregnation
6 such as Prusas.

7 JUDGE SMITH: As you have said in both briefs and on
8 record, this is a very tight art and it is known to impregnate at various stages
9 for bleaching purposes. Why wouldn't you combine the two?

10 MR. RISTAS: Because --

11 JUDGE SMITH: If one were not satisfied with the product
12 resulting from Prusas, which does say that further refining can take place,
13 why is that product incompatible with Haynes?

14 MR. RISTAS: Haynes establishes, as I said, a very different
15 kind of what appears to be a self-contained system in which he does not
16 contemplate any upstream impregnation or any crunching, if you will.

17 Normally the discharge from the refiner is very hot at the high
18 temperatures that Haynes wants to keep but in conventional thinking that is
19 quenched to get the temperature down so that subsequent peroxide treatment
20 will be effective.

21 So, the internal integration and consistency of Haynes will not
22 lead one to look to a modification such as Prusas.

23 And secondly, to the extent they looked at Prusas, if one were
24 to do an upstream, they would not incorporate the sodium hydroxide aspect

1 which is required in our claim. They would not incorporate an upstream
2 treatment in which sodium hydroxide was carried over into the refiner.
3 Haynes is specifically trying to minimize the sodium hydroxide because in
4 high temperature where they bleach, the sodium hydroxide presents a
5 problem.

6 So, if there were to be an upstream impregnation of some kind
7 added to Haynes, one in the art would not incorporate an upstream
8 impregnation that had sodium hydroxide the way we're claiming it.

9 The data in Haynes are somewhat confusing but you would best
10 understand it, the examples -- all the examples shown and the tests that were
11 performed in Haynes load all the peroxide in the refiner with this alkaline
12 buffer and no combination of alkaline and peroxide is introduced
13 downstream of the refiner. They introduce at various points alkaline and
14 eventually they can introduce just peroxide in one of the embodiments in the
15 cycle. But we could not find any example or teaching of introducing the
16 alkaline and the peroxide, even the buffered alkaline, as a combination in
17 steps downstream of the refiner.

18 Now, one could, I suppose, look at it differently and say that
19 Haynes makes general statements that the chemicals could be introduced by
20 themselves in combination, et cetera, but those are such broad-based
21 statements that we don't believe that they recognize or teach the criticality of
22 the combination of the A and the P in this case. As we say, it's the sodium
23 hydroxide and the P together as discrete quantities that idealize or that
24 provide the best match of the chemistry to the condition.

1 But whether or not you review those general comments in
2 Haynes about introducing A and P together, we believe that Haynes is still
3 so incompatible with the other art, such as Prusas or Channell, that one
4 would not combine them because they're inconsistent. The other art is
5 inconsistent with the high-temperature peroxide bleaching in Haynes.

6 JUDGE SMITH: Have you relied on any evidence to show that
7 this process produces unexpected results?

8 MR. RISTAS: In the two applications: The first application,
9 the 648, there are graphic representations that show that the pulp qualities
10 and brightness are at least as good with less energy used and less chemistry.
11 They're not dramatic but in the big scheme of things, improvements of this
12 type are what result eventually, we hope, in commercial success.

13 In the second one, there's a further example and there was a
14 comparison made of the results, test results relative to what was achieved in
15 the earlier application; and so, the consequence is the same. We get good
16 brightening while maintaining the quality at slightly less energy use.

17 So, I can't say that the results are dramatically surprising but
18 they do provide superior results to what was conventional.

19 JUDGE SMITH: Excuse me. We're dealing with a very tight
20 area.

21 MR. RISTAS: Yes.

22 JUDGE SMITH: So, the results obtained would have to be
23 more than reasonably better. There would need to be unexpected, and
24 especially in an area so close as this. You haven't shown the significance in

1 adding the AP solution together versus adding A separately from P
2 separately which I believe is the point the Examiner raised in the prosecution
3 of this case.

4 MR. RISTAS: Well, first of all, with all due respect,
5 patentability does not require dramatic, surprising results; but in a crowded
6 art, that's certainly would have helped our position.

7 JUDGE SMITH: Based on the standard presented in KSR,
8 where you're working in the same general field of endeavor, it's more likely
9 than not to combine these different processes together because the overall
10 goal is to achieve a good quality pulp with adequate
11 brightness.

12 MR. RISTAS: Yes. We don't view this as simply shifting steps
13 in the way of substitutions. As I mentioned earlier, we view this as a step
14 change in thinking of how the process should be controlled whereas we
15 -- again, instead of adjusting just one of the components downstream we're
16 now discretely adding the combination of components downstream. So, it
17 was --

18 JUDGE SMITH: Are you saying that it's never been done
19 before, to add the components together anywhere downstream?

20 MR. RISTAS: Not in the -- if you have the initial impregnation
21 with the components together. No one has previously added the two
22 components together in the refiner or the two components together in the
23 blow line.

24 The second application, the 545, is limited to application at the

1 blow valve or in the blow line which is, you know, immediately after the
2 refiner.

3 We're not saying that no one -- we're not categorically saying
4 that no one ever adjusted one or two of the -- no one ever adjusted the
5 components downstream and possibly alkaline could be used in these
6 downstream tertiary or following lines after the pulp line but not up where
7 we are introducing it in the impregnation stage and the refining or
8 immediately after the refining because that's where you get instantaneous
9 mixing.

10 So, we have the benefit of the AP introduced simultaneously
11 and it's at locations where you get instantaneous mixing, the impregnation in
12 the refiner where you have the high turbulence or in the blow line where,
13 again, you have high turbulence.

14 Anything else?

15 JUDGE SMITH: Do you have any questions?

16 JUDGE GAUDETTE: No.

17 JUDGE HASTINGS: No.

18 MR. RISTAS: Thank you.

19 JUDGE SMITH: Thank you for coming in today. At this
20 point, the case is submitted.

21 Whereupon, at approximately 10:33 a.m., the proceedings were
22 concluded.